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(56) Documents Cited
GB 2321000 A EP 0125997 A1 WO 96/28010 A1
WO 96/13560 A1 US 4173844 A US 3914901 A
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(58) Field of Search
UK CL (Edition P) A1E EAAA EAF EAJ
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(54) Abstract Title
Seed carrier.

(57) A seed carrier for carrying a plurality of seeds comprises a covering member which is adapted to prevent growth of plants other than from the seed, i.e. weeds. The covering member should therefore be opaque and it should preferably be made of a biodegradable plastic material. The seed carrier also comprises a seed carrying member to which the seeds may be attached by gluing or alternatively the seeds may be held in position between the seed carrying member and the covering member. The seed carrying member is preferably constructed from a biodegradable material such as paper, cardboard, peat, linen, hemp, felt, wool or cotton. The carrier may be impregnated with fertilisers, fungicides, pesticides and hormones. The carrier may be provided in the form of a kit and the carrying member may have different coloured grids printed on it to indicate seed spacing.

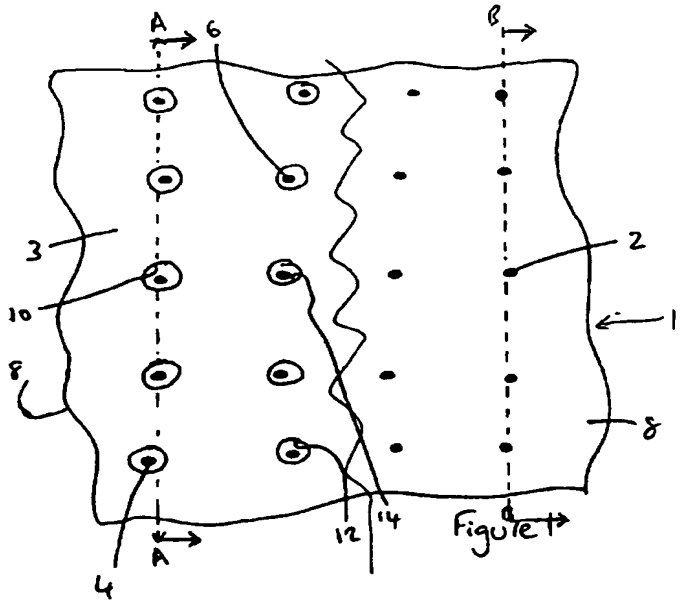

Figure 1

GB 2 328 600 A

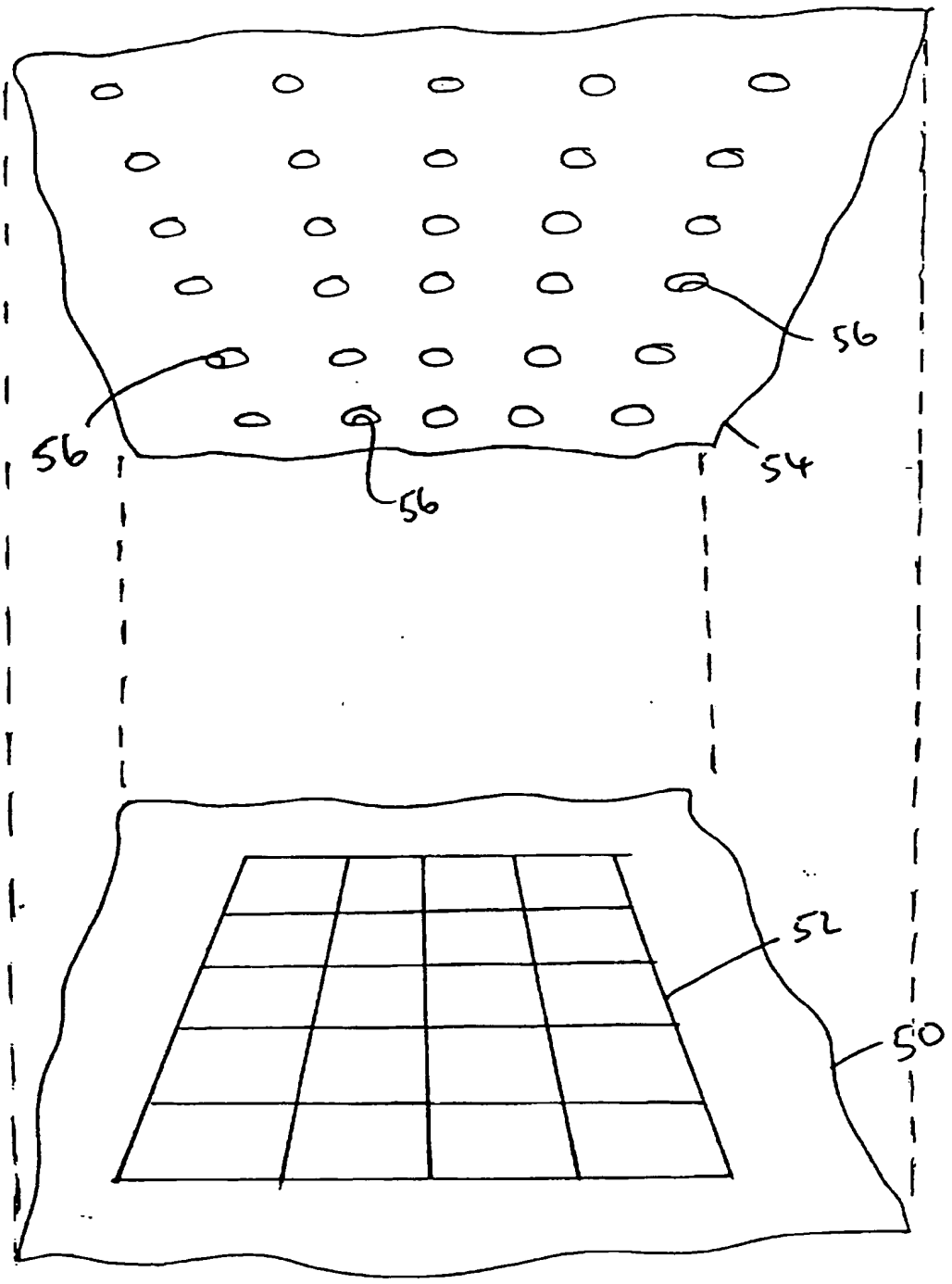

Figure 3.

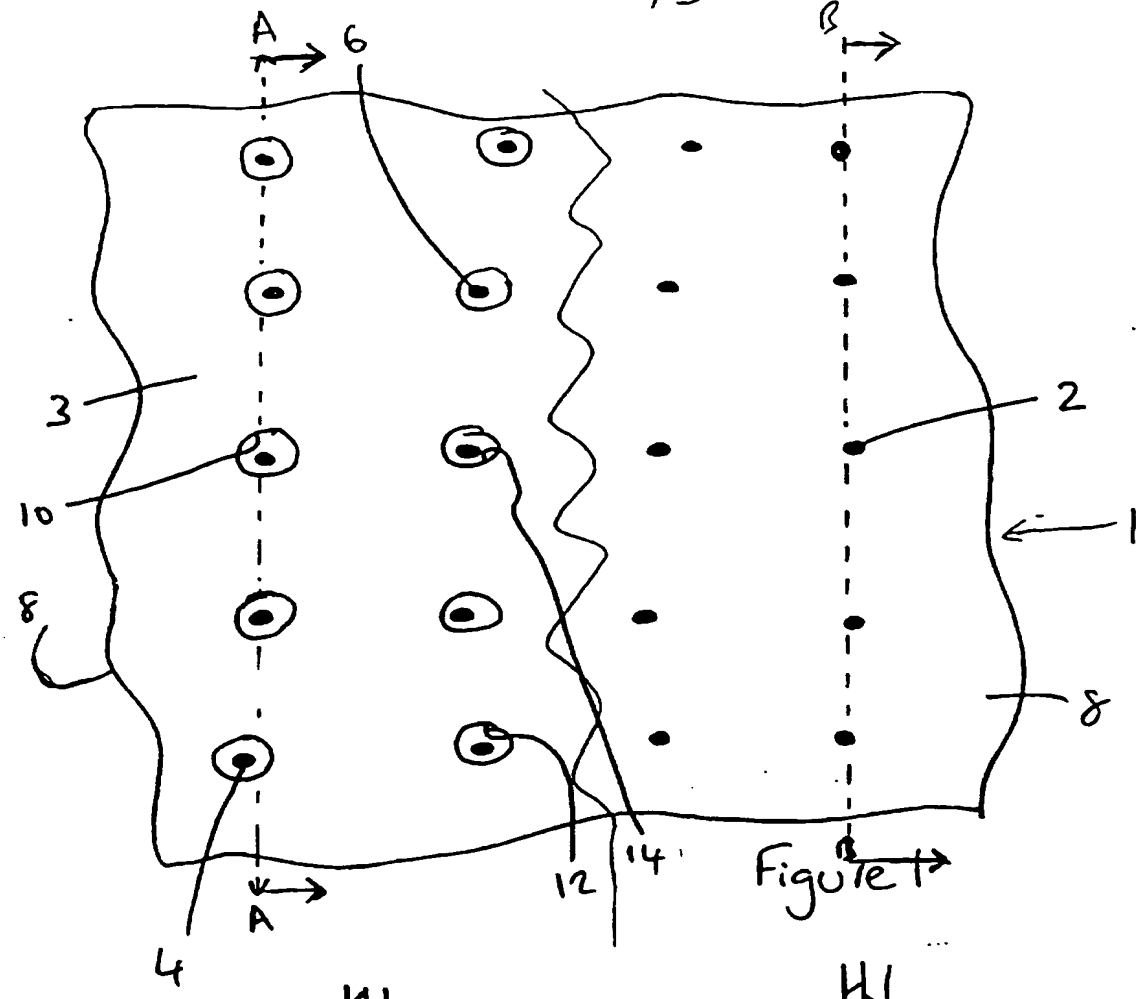

Figure 1

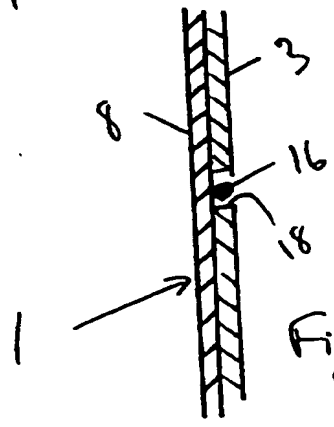

Figure 2

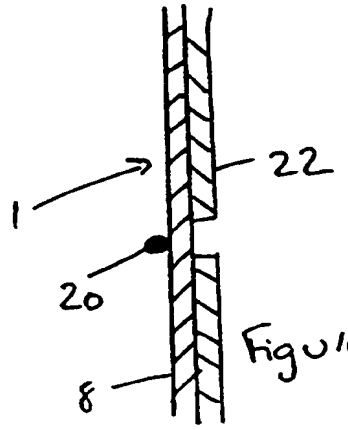

Figure 2a.

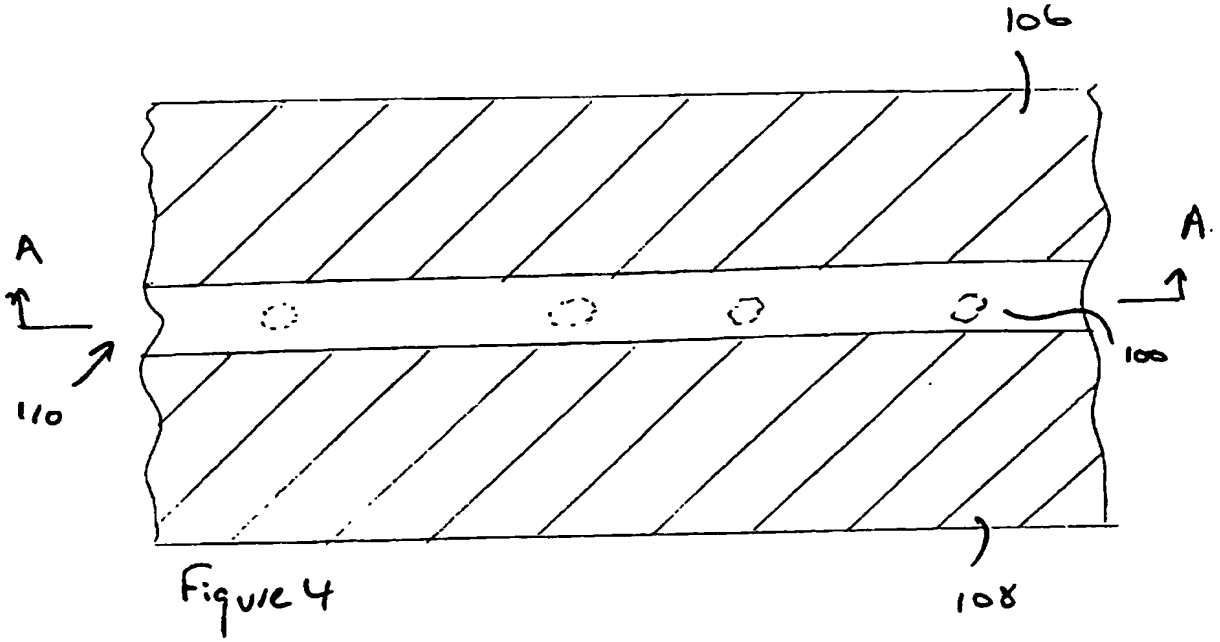

Figure 4

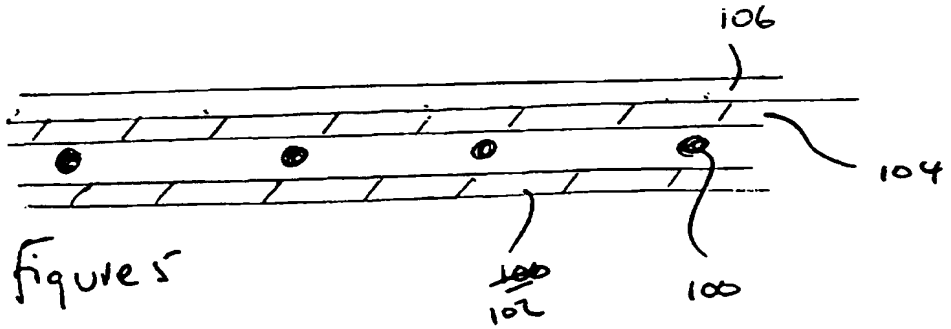

Figure 5

SEED SOWING

This invention provides an improved method and apparatus for sowing seed.

The sowing of seed in order to grow plants is well known. Traditional methods of sowing require either that a furrow be dug and the seeds placed at regular intervals along the furrow or that holes be made at a regular spacing and a seed placed in each hole. Such techniques are highly labour-intensive.

Various attempts have been made to mitigate the vagaries of the traditional seed-sowing techniques. For instance, British Patent application GB2294675 teaches the use of a seed-carrying medium to which seeds are bound in order to keep them in place.

According to a first aspect of the invention there is provided a seed carrying member adapted, in use, to carry at least one seed, said seed-carrying member being provided with a covering member wherein said covering member is adapted, in use, to prevent growth of plants other than from the seed.

In accordance with this aspect of the present invention, only the seed is allowed to grow whilst other plants, such as weeds, can be prevented from growing. Thus, the seed is allowed to grow unchallenged and may therefore grow more healthily.

The seed-carrying member may comprise a sheet. Also, the covering-member may comprise a sheet. This is especially convenient should it be desired to plant a number of seeds at any one time.

In an alternative embodiment, the seed-carrying member may be provided as a tape or strip. The covering-member may also be provided as a tape or strip. Again, this shape is convenient should it be desired to plant a number of seeds at any one time.

In use, the seed-carrying member may overlie the covering-member. Alternatively, the covering-member may overlie the seed-carrying member.

The seed-carrying member may fabricated from paper, which is cheap, biodegradable and can simply be left in the ground.

Alternatively, the seed-carrying member may be made from other biodegradable materials such as cardboard, peat or peat-like material, or perhaps cloth such as linen, felt, hemp, wool or cotton.

The covering-member may be made of a substantially light-proof material. This is advantageous because, in the absence of light, plants will not grow. Other covering-members which, in use, will prevent plants from growing are also within the scope of the present invention.

The covering member may be made of a material which prevents plants from growing.

The covering-member may be fabricated from a plastics material. This is advantageous because many plastics materials are pliable and therefore easy to manipulate. Plastics materials are especially effective in preventing unwanted plants (such as weeds) from growing.

The covering-member may be fabricated from a biodegradable material. This is particularly advantageous when the seed-carrying member is to be left in the ground, in which case the covering-member will disintegrate with the passage of time.

Preferably, the covering-member is fabricated from a slowly-biodegradable material, so preventing other plants from growing for a period of time before the covering-member disintegrates entirely.

The covering-member may disintegrate over a number of weeks, or perhaps over a number of months, or perhaps over a year. In a preferred embodiment, the covering-member disintegrates over a number of months. This is advantageous in that it corresponds to a single growing season so that plants (other than plants from the seed(s) on the carrying-member) are prevented from growing for that season, but no further action is required to return the ground to its normal condition for the next growing season.

The carrying-member may be impregnated, covered, or otherwise provided with a fertiliser and/or a fungicide and/or a pesticide, and/or a hormone.

The carrying-member may also be provided (by covering, impregnation or other treatment) with one or more substances which can act as deterrents for specific pests. For example, the use of marigold essential oil in or on the carrying-member, when the apparatus of the present invention is to be used for the sowing of carrot seeds, will deter carrot fly and similar pests. Moth balls may be used to deter mice.

Thus, fungicides, pesticides, fertilisers, hormones or other substances (when provided) can be "tailored" to give optimum protection / assistance to plant(s) which grow from the seed(s) provided on the carrying-member.

The seed(s) may be adhered to the carrying-member by means of a glue. This is a particularly convenient way of attaching the seed(s) to the carrying-member.

The seed carrying member may comprise a plurality of elements. That is the seed carrying member may comprise a plurality of sheets/strips or the like. Elements of the seed carrying member may be crimped together.

In an alternative, or additional, embodiment to that using a glue seeds may be maintained on the apparatus by being held between two elements of the seed carrying member.

Preferably, such a glue will be non-toxic relative to the seed(s).

Any glue used may conveniently be water-soluble, ensuring that once the carrying-member is correctly positioned, each seed can separate from the carrying-member. Thus, any growth of the seed(s) is not hindered by the glue.

In an alternative embodiment, the glue may be moisture-permeable so ensuring that moisture can penetrate the glue and allow the seed(s) to grow.

The seeds may be provided in an aperture within the covering member, thus allowing the seed to grow. Such an aperture may be provided coincident with the seed. The aperture may comprise a slit in the covering member.

Alternatively, a single aperture may contain a number of seeds. The aperture may be a channel. The covering member may be provided as an number of sections on the seed carrying member. The aperture may be provided by a gap between neighbouring sections of the covering member.

According to a second aspect of the invention there is provided a seed-carrying apparatus comprising a seed-carrying member adapted, in use, to carry at least one seed, said seed-carrying member being provided with a covering-member, in which the covering-member has at least one aeration means coincident with said seed.

According to a third aspect of the invention, there is provided a method of growing at least one seed comprising attaching the seed to a carrying-member, attaching to the carrying-member a covering member so that the covering member prevents the growth of plants other than the seed, and laying the seed carrying member in the ground.

The covering-member provides a suitable environment for growing the seed.

Preferably, the carrying-member is adapted to hold a plurality of seeds. By providing the seeds in the correct spacing on the carrying-member, it is possible to ensure that, when the carrying-member is placed in the ground the seeds remain correctly spaced. Such correct spacing allows for the growth of more healthy plants from the seeds.

An additional advantage is that the seeds are attached to the carrying-member and are therefore not free to move around and/or become lost. The carrying-member also provides a convenient way of handling the seeds.

Seeds held on the carrying-member may, for example, be stored until the next growing season.

According to a fourth aspect of the invention there is provided a kit comprising a carrying-member adapted to hold at least one seed and a covering-member adapted to be attached to the seed carrying member.

Such a kit is advantageous in that it allows a user to create his / her own seed-carrying apparatus for performing the method of the second aspect of the invention.

The carrying-member may be provided with a pre-printed grid as a convenient way of showing where to place seeds onto the carrying-member. The grid dimensions may be varied according to the type of seed to be used. The dimensions of the carrying-member may be such as to fit commercially-available seed-trays.

Different kits may be provided for different types of seed. Alternatively, or additionally, a single kit may be provided wherein the pre-printed grid may be varied or in which there may be a number of pre-printed grids. Where a number of different grids is provided, all of the grids may conveniently be printed on a single carrying-means in a variety of different colours. Where a number of different grids is provided for use with specified seeds, the carrying-member may be impregnated with one or more fungicides, pesticides, fertilisers or other substances appropriate to the seeds. Such "tailored" kits may be provided in appropriate colours, for example a suitably-impregnated strip can be coloured orange for use with carrot seed.

A further advantage of the pre-printed grid is that it allows the user to correctly space the seeds in the ground in the first instance and negates the need for the user to prick out the plants once they have reached a certain size.

According to a fifth aspect of the invention, there is provided a method of growing at least one seed comprising attaching the seed to a carrying-member, attaching to the carrying member a covering member so that an aeration means provided in the covering member is coincident with the seed and placing the seed carrying member in the ground.

The present invention will be further described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 shows a plan view of seeds arranged on a seed-carrying apparatus according to the present invention;

Figure 2 is a partial section along line AA of Figure 1;

Figure 2a is a partial section along line BB of Figure 1;

Figure 3 shows an exploded view of a kit according to the present invention;

Figure 4 shows a plan view of a further embodiment of the invention; and

Figure 5 shows a section through of the embodiment shown in Figure 4 along line AA.

Figure 1 shows a plan view of a seed-carrying apparatus 1 in which a number of seeds (three are shown at 2, 4 and 6) are attached to a seed-carrying member 8 comprising a sheet of flexible, biodegradable, paper. The seeds 2, 4 and 6 are adhered to the seed-carrying member 8 by means of a water-permeable glue, so allowing moisture to penetrate the glue and provide water to the seeds.

The left-hand and right-hand sides of Figure 1 show slightly different embodiments of the invention, as reflected in Figures 2 and 2a respectively. The split in Figure 1 is shown by the line along the centre of the Figure.

In the left-hand side of Figure 1 a covering-member 3 covers the carrying member 8 but has apertures (or aeration means) 10, 12 and 14 cut within it to be coincident with the seeds. These apertures allow the seeds to be placed at their correct positions on the carrying member 8 and allow air and water to reach the seed through the covering-member 3.

In the right-hand side of Figure 1 a covering-member (not shown) is provided behind the carrying-member 8. As with the covering member 3 shown on the left hand side of Figure 1, apertures have been cut in the covering member to be coincident with the seeds. These apertures (or aeration means) are for the same purpose as described in relation to the left-hand side of Figure 1.

In both of the embodiments the covering-member 3 is fabricated from a biodegradable plastics material or other slowly-biodegradable material. This allows a flexible, covering-member to be provided which decays with the passage of time and will not need to be removed by a user.

The seeds 2, 4 and 6 are arranged on a grid which positions the seeds at their optimum spacing for growth. It is well known that seeds must be placed in the ground at a certain spacing depending on the type of seed. The spacing of the seeds on the carrying member 8 corresponds to this certain spacing.

In use, a user of the seed-carrying apparatus digs, in the ground, a trench of suitable dimensions to accommodate the seed-carrying apparatus 1. The seed-carrying apparatus 1 is then placed into the trench and soil removed in digging the trench is used to cover the seed-carrying apparatus 1. Use of the seed-carrying apparatus is convenient because it allows the seeds to be correctly placed, as described above, and makes the seeds much easier to handle.

The covering-member 3 acts as a "weed shield" and prevents plants other than those growing from the seeds adhered to the carrying-member from growing. It is well known that plants require light to grow and the covering-member 3 prevents light from reaching other plants such as weeds, as well as preventing unwanted plants from penetrating the "weed shield".

The apertures 10, 12 and 14 allow plants growing from the seed to grow.

The number and position of the apertures can be determined by the user, according to the amount of light required for the seed to germinate.

In Figure 2, a seed 16 is provided within an aperture 18 in the covering-member 3. The covering-member 3 is adhered to the carrying-member 8.

In Figure 2a, a seed 20 is adhered to the carrying-member 8 and a covering-member 22 is provided adhered to the carrying-member 8 on the side remote from the seed 20.

Figure 3 shows one embodiment of a kit according to the present invention. The kit comprises a carrying-member 50 on which there has been marked a grid 52 and a covering-member 54 in which there have been formed a number of apertures 56.

In use, a user will position a number of seeds at intersections of the grid 52. The carrying-member may have a number of grids, or other such markings, marked onto it to allow for different spacing of seeds. The markings may be a number of colours to avoid confusion.

Once the seeds have been placed on the grid 52, the user locates the apertures 56 at the correct places and adheres the covering-member 54 to the carrying-member 50. The covering-member 54 can be adhered to either surface of the carrying-member 50 as is shown in Figures 1 to 2a.

Once the kit has been assembled it can be used as is described hereinbefore.

The kit may be used to store seeds which have been harvested. The harvested seeds may be adhered to the kit and then the assembled kit used to store the seeds until they are required for planting. The assembled kit thus provides a convenient way of storing seeds.

In another embodiment of the invention as shown in Figures 4 and 5 seeds 100 are maintained between two elements 102, 104 forming the seed carrying member. The elements are crimped together and the pressure of one element against the other maintains the seeds 100 in position. The covering member is provided as two strips 106, 108, with an aperture, or aeration means 110 between them. The skilled person will appreciate that the covering member 106, 108 is not shown in section in Figure 5. Therefore, the covering member may form a third ply to the seed carrying apparatus.

The skilled person will appreciate that the covering member will need to have sufficient width to be effective in preventing the growth of weeds, etc.

An aperture or aeration means in the covering member may comprise a slit in the covering member, or may comprise a weakening. Both of which may allow a plant growing from the seed to push through the covering member.

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CLAIMS

1. A seed carrying member adapted, in use, to carry at least one seed, said seed-carrying member being provided with a covering member wherein said covering member is adapted, in use, to prevent growth of plants other than from the seed.

2. Apparatus according to Claim 1, in which the seed-carrying member comprises a sheet.

3. Apparatus according to Claim 1, in which the seed-carrying member comprises a tape or strip.

4. Apparatus according to Claim 1, 2 or 3, in which the covering-member comprises a sheet.

5. Apparatus according to Claim 1, 2 or 3, in which the covering-member comprises a tape or strip.

6. Apparatus according to any one of Claims 1 to 5, in which the seed-carrying member overlies, in use, the covering-member.

7. Apparatus according to any one of Claims 1 to 5, in which the covering-member overlies, in use, the seed-carrying member.

8. Apparatus according to any one of Claims 1 to 7, in which the seed-carrying member is made of a biodegradable material.

9. Apparatus according to Claim 8, in which the seed-carrying member is made of paper, cardboard, peat or a peat-like material, or cloth, linen, hemp, felt, wool, cotton.

10. Apparatus according to any one of Claims 1 to 9, in which the covering-member is made of a substantially light-proof material.

11. Apparatus according to any of Claims 1 to 10, in which the covering-member is made of a biodegradable material.

12. Apparatus according to Claim 10 or 11, in which the covering-member is made of a plastics material.

13. Apparatus according to any one of Claims 1 to 12, in which the carrying-member is impregnated, covered or otherwise provided with a fertiliser and/or a fungicide and/or a pesticide, and/or a hormone.

14. Apparatus according to Claim 13, in which the carrying-member is further provided with one or more substances capable of acting as deterrents for specific pests.

15. Apparatus according to Claim 14, in which the substance is marigold essential oil and the pest is carrot fly.

16. Apparatus according to any one of Claims 1 to 15, in which each seed is attached to the carrying-member by means of a glue.

17. Apparatus according to Claim 16, in which the glue is non-toxic relative to the seeds.

18. Apparatus according to Claim 16 or 17, in which the glue is water-soluble.

19. Apparatus according to Claim 16 or 17, in which the glue is moisture-permeable.

20. Apparatus according to any of claims 1 to 15 wherein the seed carrying member comprises at least two elements.

21. Apparatus according to claim 18 wherein the seed is maintained held between the two elements.

22. Apparatus according to claim 19 wherein in tension between the two elements holds the seed in place.

23. Apparatus according to any one of Claims 1 to 22, in which the carrying-member is further provided with one or more pre-printed grids adapted to show where to place seeds on the carrying-member.

24. A method of growing at least one seed in an apparatus according to any one of Claims 1 to 23, in which the method comprises attaching said at least one seed to a carrying-member, attaching to the carrying-member a covering-member the covering member prevents the growth of plants other than the seeds, and laying the seed carrying member in the ground.

25. A kit of parts which when assembled forms an apparatus according to any one of Claims 1 to 20, the kit comprising a carrying-member adapted to hold at least one seed and a covering-member provided with aeration means to be coincident with said at least one seed.

26. A seed-carrying apparatus, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

27. A method according to Claim 21, substantially as hereinbefore described.

The Patent Office

Application No:	GB 9818677.8	**Examiner:**	Matt Jefferson
Claims searched:	1 to 27	**Date of search:**	12 November 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): A1E (EAAA, EAF, EAJ)

Int Cl (Ed.6): A01C 1/04.

Other: None.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, P	GB 2321000	(MEIKLE & SMITH) See page 4, lines 11 to 31, page 7, lines 17 to 20 and page 18, line 14 to page 19, line 20.	1, 2, 4 to 8, 10 to 13, 20 to 22, 24 & 25.
X	EP 0125997	(SOCIETE MEMA) See page 1, line 3 to page 3 line 1 and figures.	1, 2, 4, 8, 10 to 12, 20 to 22 & 24.
X	WO 96/28010	(BARROW ET AL.) See page 2, line 4 to page 3, line 36 and figures.	1, 2, 4, 6 to 14, 20 to 22, 24 & 25.
X	WO 96/13560	(STEVENS) See page 2, line 35 to page 4, line 5, page 5, line 32 to page 10, line 38 and figures.	1, 2, 4, 6 to 11, 13, 14, 16 to 18, 20, 21, 24.
X	US 4173844	(KNOLLE ET AL.) See col. 3, line 19 to col. 4, line 8, col. 6, lines 24 to 30 and figures.	1, 2, 4, 6 to 9, 11, 13, 16 to 21 & 24.
X	US 3914901	(MULDNER) See col. 1, lines 37 to col. 2, line 13 and figures.	1, 2, 4, 8, 9 & 11.
X	US 3888041	(SEITH ET AL.) See col. 1, lines 7 to 13, col. 2, line 47 to col.5, line 29 and figures.	1, 3, 4, 6 to 9, 11, 12 & 24.

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.